

STUDIES IN MACHAERIUM (LEGUMINOSAE) VII. SECTION II. LINEATA.

PART I. SPECIES WITH WINGLESS FRUIT.

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Bentham designated the Lineata as a series of Machaerium Pers., later raised to a section by Taubert, to comprise 12 species with alate samaroid fruit and whose leaflets have closely spaced, essentially parallel secondary veins. Four species of Drepanocarpus with similar leaflets but distinguished by fruit lunate or falcate, sometimes curved in a circle, lacking a terminal wing, were assigned to a corresponding series Lineati, later also raised to a section by Taubert, and, finally transferred to Machaerium by Ducke.

MACHAERIUM PERS. SECTION II. LINEATA (BENTH.) TAUBERT.

Machaerium Pers. section Lineata (Benth.) Taubert in Engl. & Prantl, Nat. Pflanzen.-Fam. 3(3): 337. 1894.

Machaerium Pers. series Lineata Benth., Jour. Linn. Soc. 4, suppl.: 53. 1860; in Mart. Fl. Bras. 15(1): 232. 1862.

Drepanocarpus G. F. W. Mey. series Lineati Benth., Jour. Linn. Soc. 4, suppl.: 69. 1860; in Mart., Fl. Bras. 15(1): 255. 1862.

Drepanocarpus G. F. W. Mey. section Lineati (Benth.) Taubert in Engl. & Prantl, Nat. Pflanzen.-Fam. 3(3): 338. 1894.

Trees, shrubs, or lianas; stipules spinescent or, sometimes, caducous; leaves about 5-65-foliolate; leaflets linear-oblong to ovate, elliptic, or subrhombic, secondary veins craspedodromous, veins approximately parallel, mostly extending to the margin, scarcely anastomosing; inflorescences axillary or terminal, simple or compound-racemose; bracts often spinescent; flowers about 7-16 mm long, petals white to yellow, bluish, pink, or purple; fruit alate with a terminal wing or wingless, lunate, falcate, sometimes curved into a circle.

MACHAERIUM SECTION LINEATA in part (wingless species).

Three of the following five species were included in Bentham's 1860 treatment of Drepanocarpus. The other two were described as new in 1972. The numbering of these taxa is in continuation of those in my recent paper on the species of section Machaerium (Phytologia 62: 282-302. 1987).

## KEY TO SPECIES OF SECTION LINEATA

1. Fruit lunate or falcate, sometimes curved into a circle, wingless.
  2. Leaflets obtuse or retuse, not aristate at the apes.
    3. Fruit usually curved into a circle, apex acute to subacute.
      4. Stipe of fruit 5-10 mm long; fruit essentially glabrous at maturity, about 6-8 cm long, 1.5-2.3 cm wide, usually curved into a circle (2.5-) 3-4 cm in diameter; calyx 3.5-4 mm long; leaves 5-15-foliolate; leaflets usually short-appressed-pubescent beneath. Nicaragua; Costa Rica; Panamá; Hispaniola; Puerto Rico; Lesser Antilles; Colombia; Venezuela; Trinidad; Guyana; Surinam; French Guiana; Brazil; west coast of Africa from Senegal to Angola. . . . . 9. M. lunatum
      4. Stipe of fruit about 4 mm long or less; fruit tomentose or velutinous to puberulent with lax hairs, sometimes glabrescent with maturity, 3-4 cm long, 1-1.5 cm wide, usually curved into a circle about 2.5-3 cm in diameter; calyx 4-5 mm long; leaves (13-) 21-51-foliolate; leaflets puberulent with lax or subappressed hairs but usually glabrescent at maturity.
        5. Flowers 8-10 mm long, vexillar petal moderately to sparsely pubescent; bracteoles 1-2 mm in diameter; leaflets oblong, 0.5-2.5 cm long, 0.3-1.3 cm wide; fruit tomentulose with brownish to gray hairs, glabrescent with age. Southeastern México; Belize; Guatemala; Honduras; Nicaragua; Costa Rica. . . . 10. M. falciforme
        5. Flowers 10-12 mm long, vexillar petal moderately to densely pubescent; bracteoles 3-4 mm in diameter; leaflets elliptic to oblong, 1-3.7 cm long, 0.4-1.5 cm wide; fruit densely white- to fulvo-tomentose or velutinous when young, somewhat glabrescent with age. Northern Colombia. . . . . 11. M. eliasii
    3. Fruit falcate or lunate, usually bent but not curved into a circle, 4.5-11 cm long, 1.5-3 cm wide, rounded at the apex. Colombia; Venezuela; Guyana; Surinam; Brazil. . . 12. M. ferox
  2. Leaflets aristate at the apex with awn 0.5-5 mm long; fruit bent, usually falcate or lunate or, occasionally, curved almost into a circle, usually acute at the apex. Colombia; Venezuela; Peru; Bolivia; Brazil. . . . . 13. M. aristulatum



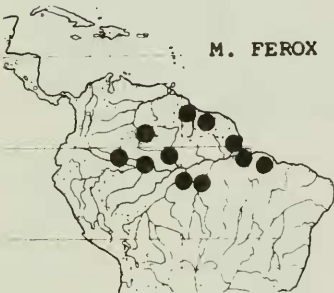
**M. LUNATUM**



**M. FALCIFORME**



**M. ELIASII**



**M. FEROX**



**M. ARISTULATUM**

Figure 1. Geographic distribution of species in Machaerium section Lineata.

9. MACHAERIUM LUNATUM (L. f.) Ducke, Arch. Jard. Bot. Rio de Janeiro 4: 310. 1925.

Pterocarpus lunatus L. f. Suppl. 317. 1781. Type: C. G. Dahlberg s. n., Surinam (Lectotype \* LINN 887.1.; isotypes LINN 887.2, 887.3, LINN-Smith herb., S).

Pterocarpus aptera Gaert., Fruct. 2: 351, tab. 156, fig. 2. 1791.  
Type: TUB ? not seen.

Drepanocarpus lunatus (L. f.) G. F. W. Meyer, Prim. Fl. Esseq. 238. 1818.

Nephrosis aculeata Rich. ex DC., Prodr. 2: 420. 1825, nomen in synon.

Orucaria lunata (L. f.) Juss. ex DC., Prodr. 2: 420. 1825, nomen in synon.

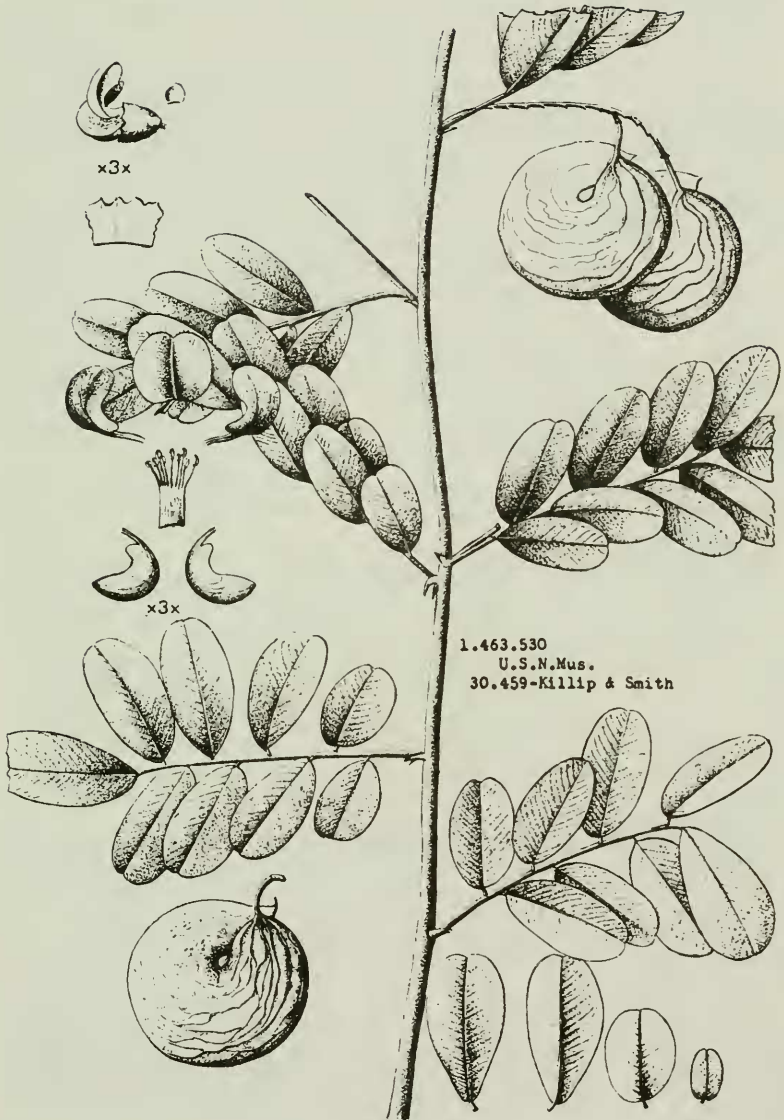
Sommerfeldtia obovata Schum., Beskr. Guian. Pl. 331. 1827; Danske Vid. Selsk. Afh. 4: 105. 1829, based on Pterocarpus lunatus L. f.

Drepanocarpus africanus G. Don, Gen. Syst. 2: 378. 1832. "Native of Guinea . . . Herb. Lamb.", A. Afzelius ? not seen.

Shrubs or small trees, sometimes scandent, to about 8 m tall; young stems usually glabrous or nearly so. Stipules indurated, spinescent, to about 7-10 mm long, 2 mm wide at the base, recurved. Leaves about 5-15-foliolate, axis essentially glabrous, about 3-9 cm long. Leaflets subcoriaceous, elliptic to oblong, sometimes obovate-oblong, 1-5 (-7) cm long, 1-2 (-3) cm wide, apex obtuse or retuse, the base rounded to cuneate, upper surface glabrous to slightly puberulent, the lower surface glabrous to moderately pubescent with minute, appressed hairs and, occasionally, a few longer hairs, glabrescent. Inflorescences axillary and terminal, paniculate, axes glabrous to subtomentulose or moderately pubescent with subappressed hairs; lower bracts spinous like the stipules; upper bracts deltoid, acute, striate, subglabrous, about 1-3 mm long, 1 mm wide at the base, caducous; bracteoles broadly ovate, obtuse, sparsely pubescent, glabrescent, about 1 mm long, 1.5 mm wide. Flowers (7-) 8-10 mm long on pedicels 1-2 mm long, calyx glabrous or sparingly pubescent, 3.5-4 mm long, 2 mm in diameter, the lobes obtuse or acute, 0.5 mm long or less; petals pale blue to purple, the vexillum pubescent to subglabrous on the outer face. Fruit lunate, not winged, usually curved so that the ends overlap forming a circle about (2.5-) 3-4 cm in diameter, subsericeous when young, essentially glabrous at maturity, about 6-8 cm long, 1.5-2.3 cm wide, stipe 5-10 mm long.

Distribution: Low lands near the sea, in brackish, sandy or clay soil, coastal marshes, mangrove swamps, sea level to about 25 m elevation. Nicaragua; Costa Rica; Panamá; Hispaniola; Puerto Rico; Lesser Antilles; Colombia; Venezuela; Trinidad; Guyana; Surinam; French Guiana; Brazil; western coast of Africa from Senegal to Angola.

\* The sheet designated as lectotype bears leaves, flowers and fruit and is a more complete specimen than those cited as isotypes.



*Machaerium lunatum* (L. f.) Ducke

Figure 2. *Machaerium lunatum* (L. f.) Ducke.

Copy of tab. 14 in Hoehne, Flora Brasílica 25 (128). 1941.

## Representative collections:

Nicaragua: Zelaya: Río Kuanwatla, 3 km W of Puerto Isabel, Neill 4575 (MEXU, MO).

Costa Rica: "marais de Sierpe", Pittier 6809 (BK).

Panamá: Chiriquí: David, Pittier 3373 (BM, NY, US). Canal Zone: Lion Hill Station, S. Hayes 681 (BM, BK, K, P, W). Darien Station, Standley 61616 (US). Fort Randolph, Standley 28693 (US). Gatun Station, Standley 27292 (US). Mamoni R., below La Capitana, Pittier 4585 (NY, US).

Puerto Rico: Low Mameyes, Aggers 923 (BK, LE, M, P, W). Bayamon, Sintenis 927 (BM, BK, G, GH, GOET, K, L, LE, M, NY, P, S, UC, US). Humacao, Sintenis 5205 (BM, F, G, MO, NY, P, POM, US); Liogier et al. 31334 (US). Vieques Isl., Santa Maria, Shafer 2669 (CAS, NY, S, US).

Haiti: Massif du Nord, Bayeux, Ekman H.4804 (GH, IJ, K, NY, S, US).

Dominican Republic: Bertero s. n. in 1821 (G, G-DC, F, MO, S). Santo Domingo, Rose et al. 3756 (NY, US). Sánchez, Peninsula de Samaná, Ekman H.14805 (G, S); Abbott 2418 (US).

Lesser Antilles: St. Croix, West s. n. (LE). St. Thomas, Aggers 329. Guadeloupe: Duchassaing s. n. (GOET); Duss 1013 (†); Questel 580 (P, US); 5148 (US); L. Rodriguez 3199 (†), 4411 (†). Martinique: Plée s. n. (†); Belanger 716 (†); Hahn 219 (BM, BK, G, LE, P, W); Sieber s. n. (NY), 324 (W), 326 (BK, GH, L, LE, M, P, W), 327 (BK); Duss 1092 (NY, US), 3371 (NY); Quentin 937 (PO); Stehlé 6062 (US). St. Lucia: Crudy s. n. (M); Anderson s. n. (K); Sturock 473 (A). St. Vincent: Caley s. n. in 1823 (G); Biolley s. n. (K).

Trinidad: Koruga, Britton & Broadway 2417 (NY, US); Broadway 7589 (NY), s. n. in 1916 (MO). Tobago: Lembeau Bridge, Broadway 4184 (L, M).

Colombia: Chocó: Río Atrato, delta, West 11 (COL); Río Atrato, 2-5 hours below Río Sudio, above Loma Teguerra, Duke 10987 (MO).

Venezuela: Sucre: Río San Juan, 53 km NE of Maturín, Breteler 4676 (COL, G, MG, SP, VEN, WAG). Monagas: Banks of Río San Juan, Tamayo 3507 (NY, SI, US, VEN). Puerto Caripito, Cardona 588 (VEN). Delta Amacuro: Punta Baja, Gines 5132 (US). Pedernales, Orinoco Delta, Curran & Haman 1300 (GH, MO, UC, US); Handover 18 (K). Misión El Guayo, Ferrari 1868 (NY). Caño Joba-Suburu, W of Caño Guayo, Stevermark et al. 115158 (MO). Between Las Margaritas and Curiapo along Río Acure, Fernandez & Trujillo 3539 (MY).

Guyana: Schomburgk 226 (P); A. Anderson s. n. (BK); Jenman 1527 (P). Georgetown, Hitchcock 16678 (GH, US); Archer 2616 (GH, US). Vree-en-Hoop, Hitchcock 16694 (GH, NY, S, US). Pomeroun R., Cruz 3006 (GH, NY, US), 3082 (F, GH, MO, NY, UC, US). Corentyne R., Jenman 372 (P). Buxton, Irwin 299 (US). Demerara R., Persaud 180 (F). Friendship, Robertson & Austin 255 (MO, NY, VEN). Berbice R. S of New Dageraad, Maas et al. 5479 (F).

Surinam: Hostmann 446 (BM, G, K, NY, P, W). Parimaribo, Wullschlägel 115 (BK, GOET, W); Fulle 314 (U), 327 (U). Domberg, Kramer & Hekking 2362 (IJ, U). Saramacca, Tijgerkreek, Stahel / Woodherbarium no. 110 (A, IAN, K, L, MAD, NY, U, UC, WAG). Liberté, Florschütz & Florschütz 911 (NY, U). Commewijne, Focke 250 (U). Nickerie, Lanjouw & Lindeman 1340 (U). Paulus Kreek, Lindeman & Kramer 231 (U).



French Guiana: Aublet s. n. (BM, W); Poiteau s. n. (G, LE). Beira do Rio Kaw, Black et al. 54-17464 (IAN, P). Cayenne, Aubréville 72 (P, US); Broadway 690 (GH, NY, US); Granville 5152 (US), 7263 (US). Between St. Laurent and Savane de Crique, Jacques, Cowan 38900 (NY, F, US). Gourdonville, Benoist 1676 (P).

Brazil: Amapá: Rio Jarí, 1 km. N of Arumanduba, Egler & Irwin 45939 (MG, NY). Rio Arguari, Egler 658 (MG, RB); Fróes & Black 27620 (IAN). Pará: Belem, Spruce s. n., July-Aug. 1859 (BM, FI, G, GH, GOET, K, LE, NY, P, RB, W), 274 (W); Pires 2695 (COL, IAN, NY); M. Silva 57805 (NY, US); Burchell 9523 (GH, K, LE, P), 9960 (K, L, LE). Ilha do Mosqueiro, Lucke s. n. (IAN); Killip & Smith 30459 (NY, SP, US); Lasseigne 4379 (F). Gurupá, Killip & Smith 30595 (NY, SP, US). Marajó, Oliveira 3429 (IAN, NY), 5058 (IAN); Huber /MG no./ 293 (MG), 1695 (MG). Piahy: Farnahyba, Ducke /MG no./ 852 (MG), /RB no./ 11768 (RB). Guanabara: Rio de Janeiro, cultivated, Glaziou 9725 (K, P).

Senegal: Ferrotet 254 (BM); Chevalier 3430 (G).

"Senegambia": Heudelot s. n. (K); Leprieur s. n. (G, P).

Gambia: Heudelot 339 (F), 639 (G); Robertv 10863 (G); T. h. Hayes 553 (K); Dalziel 8068 (K).

Sierra Leone: G. Don s. n. (B.); Afzelius s. n. (BM); Deighton 991 (BM, K); Korton & Jarr 925 (K, WAG), 2190 (WAG); Thomas 9557 (BR), 9561 (P); Scott Elliott 4335 (BM, K).

Liberia: Baldwin 10505 (K), 10885 (K); Bos 2994 (WAG); de Wit 9130 (WAG); Voorhoeve 98 (WAG).

Ivory Coast: Leewenberg 2716 (K, WAG); de Wit 1254 (WAG); de Wilde 90 (WAG), 782 (WAG); Oldeman 150 (WAG); Chevalier 12244 (P), 17268 (P).

Ghana: Morton A 207 (K, WAG), 2066 (K), 6597 (K).

Nigeria: Dalziel 930 (B., BR, K, S); Onochie & Ujor /For. Serv. Ibaden/ 32936 (K, WAG); Hamblen 407 (K); Gillett 15375 (K).

Cameroon: Bates 177 (K); Maitland 397 (K).

Gabon: Klawe 205 (BR, K, P); Debeaux 171 (K).

"Congo": Toussaint 37 (BR, P); Flamigni 10779 (BM, BR, US).

Angola: Welwitsch s. n. (BM, K, P); Gossweiler 358 (BR, K, P).

Local names: Amourette (French Guiana); aripillo (Venezuela); atoelia (Surinam); aturia (Brazil); bodorie (Surinam); brandie maka (Surinam); brantimakka (Surinam); bundary bush (Guyana); chinese earring (Guyana); cortiça (Brazil); croc chien (Guadeloupe, Martinique); mangle piquant (Martinique); olvidanovia (Venezuela); siete conchas (Venezuela); turia (Brazil).

Economic uses: According to Irvine (Woody Plants of Ghana, p. 370. 1961) the ripe fruits are eaten in Sierra Leone. In the Gambia a root infusion is used for diarrhoea. On the Ivory Coast "the pulped leafy stems are used as a liniment and plaster for intercostal pains in the joints, backache, and asthenia", "a concoction of crushed leaves is used for heart trouble and for venereal diseases and aphrodisiacs. It is purgative. It is used for leg swelling, and stomach troubles . . . and for leprosy." It is also said to be fairly poisonous to mice. The plant is used as an ingredient in arrow poison.

10. MACHAERIUM FALCIFORME Rudd, Phytologia 24: 125. 1972.

Type: P. H. Gentle 4744, Belize, Toledo, Rio Grande, on river bank, 8 August 1944 (holotype US; isotypes F, IJ, MEXU, UC).

Trees, shrubs, or lianas, to about 30 m tall; young stems ferrugineo-puberulent, glabrescent with age. Stipules spinescent, to about 10 mm long, 2 mm wide at the base, recurved. Leaves (13-) 21-33-foliate, axis fulvo-tomentulose, (5-) 7-11 cm long. Leaflets oblong, 0.5-2.5 cm long, 0.3-1.3 cm wide, obtuse at apex and base, surfaces pubescent with subappressed hairs, often glabrous at maturity, sometimes discolorous. Inflorescences axillary or terminal, paniculate, axes ferrugineo- or fulvo-tomentulose; bracts spinescent like the stipules; bracteoles pubescent, broadly ovate, 1-2 mm long and wide. Flowers 8-10 mm long on pedicels 1-2 mm long; calyx sparsely pubescent to glabrous, sometimes setose, about 5 mm long, 3 mm in diameter, the lobes acute or subacute, 1 mm long or less; petals blue, purple, pink, or white, the vexillum moderately to sparsely pubescent on the outer face. Fruit lunate to falciform, brownish- to gray-tomentulose, sometimes sparsely setose, glabrescent with age, 3-4 cm long, 1-1.5 cm wide, often curved forming a circle about 2.5-3 cm in diameter, stipe about 3 mm long or less.

Distribution: In swamps, wet areas, moist forest, southeastern México; Belize; Guatemala; Honduras; Nicaragua; Costa Rica, from sea level to about 700 m elevation.

## representative collections:

México: Veracruz: Ojapa, Orcutt 5139 (MO, US). Fortuño, Rio Coatzacoalcos, Ll. Williams 8496 (F, US), 8808 (F, MICH). Minatitlán, 8 km NE, King 1097 (MEXU, MICH). Region de Los Tuxtlas, Rio Coscoapán, Sousa 3178 (MEXU). Sontecomapa, Rio Chuniapa, Sousa 4425 (GH, MEXU). San Lorenzo Tenochtitlán, Chavelas ES-2846 (MEXU). Tabasco: Boca del Cerro, Tenosique, Matuda 3545 (F, K, MEXU, MICH, MO, NY, US), 3546 (A, F, MEXU, MICH, NY, US). 3 mi W of Cárdenas, Janzen 1082 (MICH, US). Arroyo Santa Anita, 40 km N of Villahermosa, Barlow 31/3 (MICH). Rio Boca Grande, Barlow 31/3b (MEXU). Backmarsh of Rio González, 40 km N of Villahermosa, Barlow 3b/5 (BM, DS, F, GH, UC). Campeche: Palizada, Matuda 3841 (A, F, MEXU, MICH, NY). Rio en la Laguna Pom, rumbo a La Laguna de San Ignacio, Menendez 476 (F).

Belize: Toledo: Near Condemn Branch Hills, Gentle 5363 (LL, US). Malfredi Lagoon, Schipp S-555 (F). Jacinto Creek, Schipp S-577 (A, F, GH, K, MICH, NY, S). Rio Grande, Gentle 4855 (F).

Guatemala: Petén: Between Cedral and Ceibal, Rio Santa Monica, Steyermark 46031 (F, LL, NY). between Cerro Ceibal and Ceibal, Steyermark 46159 (F, LL). Along Rio Cancuen above Sayaxché, Steyermark 46179. Izabal: Cadenas, San Felipe Road, Contreras 9232 (F).

Honduras: Hjalmarsson s. n. in 1852 (S), in 1853 (S). Atlántida: Tela, van Severén 66 (US); Standley 54755 (A, F, US). Copán: Copán, Between Sta. Rita and Jaral, Rio Copán, Molina 26216 (BM, F, NY, US). Copán, Molina 30608 (F).



Nicaragua: Bluefields: Tidewater, Cukra, Long 157 (F). Zelaya: La Esperanza Río Grande, Molina 2118 (F), 2183 (F, GH).

Costa Rica: San Jose: El General, above Pejibaye, Molina et al. 18247 (F, NY); Jiménez 3798 (F, US).

Local names: Sangregado, zarza de Mucal (México).

11. *MACHAERMIUM ELIASII* hudd, Phytologia 24: 123. 1972.

Type: Bro. Elias 1242, Colombia, Atlántico, Las Flores, vicinity Barranquilla, July 1934 (holotype US; isotypes F).

Shrubs or lianas, about 4-5 m tall; young stems fulvo-tomentulose, later glabrescent. Stipules spinescent, to about 10 mm long, 4 mm wide at the base, recurved. Leaves (15-) 21-51-foliolate, the axis 4-10 cm long, tomentulose. Leaflets elliptic to oblong, discolorous, 1-3.7 cm long, 0.4-1.5 cm wide, obtuse, sometimes shallowly retuse, base rounded, the upper surface lightly pubescent when young, glabrous at maturity, lower surface pubescent with appressed or subappressed hairs to subglabrous. Inflorescences terminal or axillary, racemose or paniculate, axes cano- to fulvo-tomentulose; bracts striate, spinescent, to about 5 mm long, 1-2 mm wide at the base; bracteoles ovate, striate, sparsely pubescent, 3-4 mm long and wide. Flowers 10-12 mm long on pedicels 1-2 mm long; calyx 4-5 mm long, 3.5 mm in diameter, moderately pubescent with subappressed white hairs, sometimes sparsely setose, the lobes 1 mm long or less; petals blue or purple, vexillum moderately to densely pubescent on the outer face. Fruit lunate, densely white- to fulvo-tomentulose or velutinous when young, somewhat glabrescent with age, about 3.5 cm long, 1.8 cm wide, often curved into a circle 2-3 cm in diameter, stipe about 3-4 mm long.

Distribution: known only from northern Colombia in low wet areas.

Collections examined:

Colombia: Atlántico: Vicinity of Barranquilla, Bro. Elias 1319 (F, US); Bro. Faul C-4 (US). Magdalena R., Dupand 1005 (F, MAD).

The Curran collection cited above, in flower only, has narrow leaflets and resembles the closely related *M. falciforme*. Because of its geographic location it is more or less tentatively assigned to *M. eliasii*.

12. *MACHAERMIUM FEROX* (Mart. ex Benth.) Ducke, Arch. Jard. Bot. Rio de Janeiro 4: 311. 1925, non *M. ferox* Glaziou 1906, nom. nud.

*Drepanocarpus ferox* Mart. ex Benth. Comm. Leg. Gen. 32. 1937; Ann.

Wiener Mus. 2: 96. 1839. Lectotype: C. F. P. Martius s. n., Brazil, Rio Japura, "in sylvis Tapurensibus provincieae Rio Negro" (M).

*Drepanocarpus ferox*  $\beta$  *macrophyllus* Benth. in Mart. Fl. Bras. 15(1): 256. 1862. Type: R. Spruce 3213, Venezuela, Amazonas, Rio Casiquiare, Dec. 1853 (holotype K; isotypes BM, BK, K, NY, P, RB, W).

Lianas, shrubs, or small trees, to about 20 m high; young stems pubescent. Stipules spinescent, 4-5 mm long, 2-4 mm wide at the base, recurved. Leaves about 15-35-foliolate, axis puberulent, about 8-18 cm long. Leaflets coriaceous, elliptic-oblong, about 0.8-6 cm long,

0.5-2.5 cm wide, apex obtuse or retuse, base rounded, upper surface puberulent, becoming glabrous, nitid at maturity, the lower surface pubescent with lax hairs, glabrescent with age. Inflorescences terminal, racemose or paniculate, the axes ferrugineo-velutinous; bracts 3-6 mm long, 1-3 mm wide at the base, usually caducous; bracteoles broadly ovate, 2 mm long, 3 mm wide, pubescent. Flowers 10-13 mm long on pedicels 1-2 mm long; calyx ferrugineo-pubescent, 4-5 (-7) mm long, 2.5 mm in diameter, the lobes 1 mm long or less; petals pink, violet, or purple, the vexillum puberulent on the outer face. Fruit falcate or lunate, usually bent but not curved into a circle, ferrugineo-puberulent or sericeous, glabrescent with age, 4.5-11 cm long, 1.5-3 cm wide, rounded at the apex, stipe about 5 mm long.

Distribution: In moist riparian forest, inundated or non-inundated, at low elevations.

Representative collections:

Colombia: Amazonas: Soratama, between Río Kananari and Río Pacoa, Río Apaporis, García-Barriga 14079 (COL, VEN).

Venezuela: Delta Amacuro: carretera Caño Guará a La Horqueta, Stergios et al. 5271 (PORT). Amazonas: Río Orinoco just below mouth of Río Atabapo, Wurdack & Adderly 42793 (F, G, GH, IAN, K, NY, P, R, S, UC, US, VEN). Río Orinoco above Esmeralda, Ll. Williams 15495 (F, US, VEN), 15496 (F, NY).

Guyana: Schomburgk 267 (K). Demerara R., For. Serv. B. G. 6346, Fanshawe 3016 (K, NY, U); Jenman 4281 (K), 7341 (K, U); Persaud 234 (F); Cruz 1746 (F, GH, MO, NY, UC, US). Mazaruni R., Sandwith 638 (K, NY); Jenman 7526 (NY); Appun 306 (K). Between Demerara R. and Berbice R., Cruz 1611 (F, GH, MO, NY, UC, US). Dadanawa, upper kupununi R., Cruz 1746 (F, GH, MO, NY, UC, US).

Surinam: Corantijne R., Hulk 94a (U). Nickerie R., Stahel & Gonggrip 1082 (U).

Brazil: Amapá: Mun. de Macapá, 154 km NW of Porto Grande, highway "Perimetral Norte", BR 210, Fazenda Sucupira, Rabelo et al. 3076 (NY). Porto Grande, região do Vila Nova, Rosa 1054 (NY, SFV). Serra do Navidad, Cowan 38564 (IAN, NY, US). Rio Araguari, Pires et al. 51483 (G, GH, IAN, K, MG, NY, U, US). Maranhão: Alzilândia, Rio Pindaré, Jangoux & Bahia 488 (NY), 489 (NY). Pará: Sieber s. n. (BK, syntype of D. ferox). Ega (Tefé), Koeppig 2884 (F, W probable syntypes of D. ferox). "Ad cataractas fl. Aripecuru", Spruce s. n. (K, NY, RB, W). "Cach. do R. Aripecuru", Spruce 546 (K, P). Alto Tapajós, Rio Cururú, 1-10 km SE from Prataí, Anderson 10888 (NY, SFV). Beira do Rio Curuaúna, Planalto de Santarem, Fröes 31357 (IAN). Belém, Igarapé do Aurá, Pires 1434 (IAN, NY). Rio Tapajós, Periquito, Ducke /MG no./ 15871 (MG). Rio Tapajós, Cach do Mangabal, Ducke /MG no./ 16752 (MG). Mosqueiro, Lucke 774 (IAN, F, MG, MO, NY, SI, R, UC, US); Killip & Smith 30510 (NY, US). Rio Pixuna, near mouth of Rio Cupari, Black 47-1996 (IAN, US). Breves (Araná), Huber /MG no./ 1842 (BM, MG, US). Rio Caraiquí, Daly et al. 1279 (NY, SFV). Amazonas: Rio Javari, 7 hours above Paumar, Prance et al. 23794 (NY, SFV). Maués, Rio Parauri, Rodrigues & Coelo 3911 (US). Rio Negro, "inter Barra et Barcellos", Spruce 2038 (P). "Rio Negro-gapo near S. Isabel", Spruce 2038 (K). Road Humaitá to Porto Velho, Prance et al. 3845 (COL, F, GH, K, MG, NY, R, S, U, UC, US).

Local names: Aturiá (Brazil); bejuco de Murciélago (Venezuela); juquiry preto (Brazil); uña de gavilan (Venezuela).

Note: The fruit illustrated in plate 81, Martius, Fl. Bras. 15 (1). 1862 appears to be of *M. aristulatum* rather than *M. ferox*.

13. MACHAERIUM ARISTULATUM (Spruce ex Benth.) Ducke, Arch. Jard. Bot. Rio de Janeiro 4: 311. 1925.

*Drepanocarpus aristulatus* Spruce ex Benth. Jour. Linn. Soc. 4, suppl.: 69. 1860; in Mart. Fl. Bras. 15(1): 1862. Type: *R. Spruce 1756*, Brazil, Pará, Lago de Alexo, below Santarem, August 1851 (holotype K; isotypes BM, F, FL, G, GH, GOET, M, NY, P, RB, US, W).

Trees, shrubs, or lianas, to about 10 m high; young stems usually gray-tomentulose, glabrescent with age. Stipules spinescent, to about 15 mm long, 5 mm wide at the base, recurved. Leaves about 11-15-foliolate, axis 5-12 cm long, subglabrous. Leaflets elliptic to ovate or oblong, 2-7.5 cm long, (0.6-) 1-3 cm wide, obtuse to acute, sometimes emarginate at the apex, aristate, the awns (0.5-) 1-5 mm long, base rounded, upper surface usually glabrous, nitid, lower surface pubescent with short appressed or subappressed hairs, secondary veins almost perpendicular to the midvein. Inflorescences axillary or terminal, paniculate, grayish-tomentulose; bracts spinous like the stipules, to about 5 mm long or deltoid, caducous; bracteoles broadly ovate, 2 mm long, 2.5 mm wide, sericeous or subsericeous. Flowers 10-14 mm long on pedicels 1-2 mm long; calyx sericeous, 5-7 mm long, 4 mm in diameter, lobes acute, 1 mm long or less; petals white to yellowish, pale blue, violet, or purple, vexillum pubescent on the outer face. Fruit usually falcate or lunate, 3.5-7 cm long, 2-3 cm wide, occasionally curved almost into a circle 2.5 cm in diameter, tomentulose, sometimes beset with setae, glabrescent with age, usually acute at the apex, stipe about 5 mm long.

Distribution: In wet savanna, river banks, igapó, várzea, at elevations up to about 200 m, Colombia, Venezuela, Peru, Bolivia, and Brazil.

Representative collections:

Colombia: Boyacá: Esmeralda, Río Casanare, *Cuatrecasas 3936* (F, US). Vichada: Caño de la Ceiba, *Cuatrecasas & García-Barriga 4093* (COL, F, US). Vaupes: Río Guaviare, *Cuatrecasas 7583* (COL, F, US); opposite San Fernando de Atabapo, *Araque, Molina, & Barkley 17Va217* (COL, US). Amazonas: Lago el Badio, Río Amazon, 2 km N of Leticia, *Sastre & Gómez-Pompa 513* (COL, MEXU, P).

Venezuela: Barinas: reserva forestal de Caparo, *Jiménez Saa 1317* (NY). Guárico: El "Baúl, Llano de Calabozo", *Karsten s. n.* (W). Caño Galcón, estero de Camaguán, *Aristeguieta 7785* (NY). Apure: *Curran 649* (NY). Guasdalito via Suripá, *Aristeguieta & Agostini 4146* (F, US, VEN). Río Meta, La Ochovera, *Cuatrecasas & García-Barriga 4149* (COL, F, US). Caño N of Meta, W of Pto Paéz, *Velez 2283* (VEN). San Fernando, Río Arauca 5 km S of El Faro, *Daviase & González 13447* (US). Opposite Raudal Marimare, between Río Orinoco and Piedra La Villa, *Wurdack & Monachino 41395* (G, GH, LAN, K, MICH, NY, P, S, U, US, VEN, W).

Peru: Loreto: Iquitos, Ducke /MG no./ 7548 (BM, MG, US). Río Itaya, above Iquitos, Killip & Smith 29544 (A, F, NY, US); Gentry et al. 18502 (F); Mevilla 618 (F), 652 (F). Lower Itaya, near Iquitos, Davidson & Jones 9890 (F). Río Nanay between Bellavista and Sta. Clotilde, McDaniel et al. 2473 (US). Maynas, Quebrada Yanayacu above Bombonaje, McDaniel & Kimachi 17222 (SFV). Río Nanay, Quebrada de Yarina Cocha, Kimachi 2366 (F). Pebas, Río Ampiyacu, Mevilla 825 (F). Carretera a Quisotocha, 10 km NE of Iquitos, Torres 147 (F). Quebrada Yarina Cocha, Río Tapiche, 35 km from Requena, Mevilla s. n. (F). Paca-Cocha (Pucallpa), Woytkowski 6309 (GH, US). Reserva Nacional Pacaya (Cocha Yarina), Vasquez et al. 6661 (SFV ex MG). Caballo-Casha, Amazon R., LL. Williams 2277 (F).

Bolivia: El Beni: Trinidad, Misiones Guarayos, Werdermann 2379 (S), 2433 (S); Cardenas 3762 (S). Ballivián, espíritu, arroyo Tarapalito, Beck 5607 (SFV), arroyo Carnaval, Beck 5731 (SFV). Moxas, San Ignacio "hacia San Borja", Beck 12201 (SFV). Pando: Río Manuripi, 2 km upriver from ferry crossing on road to Chivé, Sperling & King 6526 (SFV ex NY).

Brazil: Roraima (Rio Branco): Beira do Rio Branco, between Fazendas Bom Intento and Capela, Black 51-14040 (IAN, P, R). Rio Apiaú, km 5-15 from mouth, Prance et al. 4175 (COL, F, GH, K, MG, NY, S, U, US). Serra de Carauma, Ule 7725 (G, K, L, MG, UC). Pará: Itaboca, Rio Tonantins, Ducke /MG no./ 16222 (MG). Caquetá, Puerto Cordoba, Ducke /MG no./ 12246 (MG). Oriximiná, Rio Trombetas, Cid et al. 2397 (NY, US). Monte Alegre, Sneathlge /MG no./ 9558 (MG); Traill 158 (K); Ducke /MG no./ 10006 (MG); Frões 30204 (IAN, NY). Maicuru, Pires et al. 6535 (IAN, NY). Near Parana do Ricardo, Krukoff 5904 (A, BM, BR, F, IAN, K, LE, MCH, MO, NY, S, SP, U, US). Rio Jamundá, Faro, Lago de Terra Santa, Silva 1182 (MG, SP). Taperinha, near Santarem, Zerny s. n. in June 1927 (W). Amazonas: São Paulo de Olivença, Ducke 564 (F, IAN, MG, MO, NY, K, US). Tonantins, Ducke 1512 /MG no./ 18180 (A, F, IAN, MG, NY, K, US). Lago Prêto, 2 km N of Lábres, Prance et al. 15966 (F, GH, K, MG, NY, US). Rondônia: Rio Riberão, basin of Rio Madeira, Prance et al. 6558 (K, MG, NY, K, US).

Local names: Chirapa silla (Peru); garabata casha (Peru); juquirí (Brazil); robasesina (Venezuela); unha de cigana (Brazil); uña de gato, uña de gavián (Colombia).